Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Accessible Emergency Information, and Apparatus	)	
Requirements for Emergency Information and	)	
Video Description: Implementation of the	)	MB Docket No. 12-107
Twenty-First Century Communications and	)	
Video Accessibility Act of 2010	)	

STATUS REPORT OF THE AMERICAN COUNCIL OF THE BLIND, THE AMERICAN FOUNDATION FOR THE BLIND, AND THE NATIONAL ASSOCIATION OF BROADCASTERS

I. Background

In November 2016, the Commission granted a joint request of the American Council of the Blind (ACB),[1] the American Foundation for the Blind (AFB),[2] and the National Association of Broadcasters (NAB)[3] (collectively, Petitioners), for a limited extension of a waiver of 47 C.F.R. § 79.2(b)(2)(ii), which requires television broadcasters to aurally describe visual, non-textual emergency information.[4] Petitioners explained that compliance

[1] The American Council of the Blind (ACB) is a leading national nonprofit organization that represents the interests of blind and visually impaired people throughout the United States, with tens of thousands of members from across the country who belong to more than 70 state and special interest affiliates.

[2] The American Foundation for the Blind removes barriers, creates solutions, and expands possibilities so people with vision loss can achieve their full potential.

[3] NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

[4] *Accessible Emergency Information, and Apparatus Requirements for Emergency Information and Video Description: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010, Video Description: Implementation of Twenty-First Century Communications and Video Accessibility Act of 2010*, *Petitions for Waiver*, MB Docket Nos. 12-107 and 11-43, Memorandum Opinion and Order, 30 FCC Rcd 5012 (2015) (2015 Waiver Order); *Accessible Emergency Information, and Apparatus Requirements for Emergency Information and Video Description: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010,* MB Docket No. 12-107, Joint Petition for Extension of Limited Waiver (filed Sep. 2, 2016) (Waiver Extension Petition); *Accessible Emergency Information, and Apparatus Requirements for Emergency*

by the established deadline of November 26, 2016, had proven impossible due to circumstances beyond broadcasters' control. Specifically, broadcasters remained incapable of aurally describing visual information in emergency crawls, such as dynamic radar maps, because no such automated technical solution for doing so existed.[5] All known potential developers of a solution remained stymied by the challenge of automatically creating aural descriptions of dynamic graphics that are generated by software that does not contain text files that can be converted into speech. Given these circumstances, we stated that retaining the existing deadline may compel some broadcasters to remove graphics from emergency news alerts, to avoid violating the rule.[6]

The Commission agreed, finding good cause to waive the requirement for an additional period of 18 months, until May 26, 2018.[7] The Commission stated that an extension would allow Petitioners to continue working with potential developers of a technical solution. The Commission also noted that delaying the deadline would provide the Commission's Disability Advisory Committee (DAC) time to consider the issue.[8] However, the Commission conditioned the waiver extension on a requirement that Petitioners submit a status report on efforts to develop a technical solution to the Media Bureau and Consumer and Governmental Affairs Bureaus on November 22, 2017.[9]

As directed in the Waiver Extension Order, Petitioners describe below our understanding of the extent to which emergency-related images are displayed (during non-

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Information and Video Description: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010, MB Docket No. 12-107, Memorandum Opinion and Order, 31 FCC Rcd 12540 (2016) (Waiver Extension Order).

[5] Waiver Extension Petition at 5-6.

[6] *Id*. at 6.

[7] Waiver Extension Order, 31 FCC Rcd at 12544.

[8] *Id*. at 12543.

[9] *Id*. at 12544-55.

newscast programming) with a corresponding crawl that reflects the critical details conveyed by the image.[10] We also provide an update on the development of an automated method for aurally describing visual, non-textual information, such as dynamic radar maps.

II. Status Update

Since adoption of the Waiver Extension Order a year ago, Petitioners have diligently worked together toward the development of a solution that would allow broadcasters to aurally describe visual emergency information in text crawls. The broadcasting industry and accessibility community share a common goal of improving the access of persons who are blind and visually impaired to television programming, and this cooperation has helped to deepen each other's appreciation for the benefits of, and challenges to, meeting the Commission's requirement.

A. Dissemination of Critical Details

Section 79.2(b)(2)(ii) of the rules states: "Emergency information that is provided visually during programming that is neither a regularly scheduled newscast, nor a newscast that interrupts regular programming . . . must be made accessible to individuals who are blind or visually impaired, through the use of a secondary audio stream to provide the emergency information aurally."[11] Emergency information is defined as information "about a current emergency, that is intended to further the protection of life, health, safety, and property, *i.e.*, critical details regarding the emergency and how to respond to the emergency."[12] Such "critical details" include, but are not limited to, "specific details regarding the areas that will be affected by the emergency, evacuation orders, detailed

[10] *Id*. at 12545.
[11] 47 C.F.R. § 79.2(b)(2)(ii).
[12] *Id.* at § 79.2(a)(2).

descriptions of areas to be evacuated, specific evacuation routes, approved shelters or the way to take shelter in one's home, instructions on how to secure personal property, road closures, and how to obtain relief assistance."[13]

The Commission seeks information about the extent to which images are conveyed with a corresponding on-screen crawl that includes the critical details conveyed by that image. To the best of our knowledge, in virtually all cases, the critical details about an emergency that are conveyed by an image already are contained in a text crawl that is aurally described. This is so because television stations typically provide maps and other graphics to reinforce and clarify verbal emergency news, and not to convey separate information. Thus, as found by the Commission, the visual information is generally duplicative of the information contained in a crawl, which is aurally described.[14] The Commission further concluded that, to the extent the critical details regarding an emergency are aurally described because they are contained in a crawl, then aurally describing the graphic image would be unnecessary.[15]

It is exceedingly rare for a television station to broadcast an image that conveys information not already captured in an accompanying text crawl. One example – indeed, the only conceivable example – is when a dynamic graphic shows the movement of a tornado, hurricane or other event across a geographic area. It is possible that in this rare instance a text crawl would not be able to fully describe the details of an image. The challenges to automatically generating aural text crawls that describe such moving images remain. However, we can submit with substantial certainty that in almost all such cases, television

[13] *Id*. at note.
[14] Waiver Order, 30 FCC Rcd at 5022.
[15] *Id*.

stations provide live, often on-the-scene, reporters to fully describe the details conveyed by the graphic. Viewers who are blind or visually impaired therefore receive an accurate, complete description of graphics aired on-screen during non-newscast programming.

B. Development of a Technical Solution

Implementing the rule for text-based emergency information requires stations to convert emergency crawl graphics into audio, route that audio through their facilities, and encode that audio onto a secondary audio stream for broadcast.[16] Doing the same for visual images is more challenging because the software used to automatically generate such images do not contain text files that can be converted into speech for purposes of creating an audible crawl.[17]

Since adoption of the Waiver Extension Order, Petitioners have taken meaningful steps toward resolving this problem. NAB has surveyed broadcasters across the country for successful solutions they may have encountered. These contacts occurred through individual calls to television group executives and station personnel who are responsible for weather information and captioning services. We have also engaged NAB's Television Technology Committee, which consists of senior engineers from a range of large and small television companies. The issue was also raised during the annual NAB Show. Externally, we have reached out to the major vendors of weather information and other companies that traditionally serve the broadcasting industry, including the Weather Company, which is the leading platform for weather and related information.

Unfortunately, none of these parties can point to any viable technical solutions for complying with the rule that are available today. Our understanding is that software

[16] Waiver Extension Petition at 4-5.
[17] *Id*.

developers and system providers have not yet overcome the problem of automatically creating descriptions for radar maps and other moving graphics that are generated by software that does not contain text files that can be converted into speech.

Petitioners have also engaged with industry leaders and technical scholars that do not normally serve the broadcasting industry about the current and near future capabilities of converting live video images to accessible text and audible descriptions. The goal has been to identify ways emergency crawl video feeds passed through by broadcast and cable stations could build in real-time video description of the emergency feeds. This engagement has affirmed current open source software frameworks under development by research institutions and tech companies.

One leading example is from the University of California at Berkeley, which has developed an open source platform called the CAFFE Deep Learning Framework, through Berkeley's Artificial Intelligence Research (BAIR) laboratory. CAFFE allows for image recognition to occur by taking scannable images and finding comparable images with high degree of image recognition certainty stored in the cloud, in turn creating a knowable positive identification of the current image being viewed, allowing for tagging and identification across a wide network of fixed and mobile computers.[18]

The deep learning construct allows for platforms to learn on their own, continually expanding the library of tagged images in the cloud. This is a key part of AI, wherein the arduous task of taking millions of images and uploading them to the cloud by one individual is drastically reduced through crowd sourcing and the ability of computers to work in harmony as does a hive of bees or school of fish does in a natural setting—a global cross-

[18] *See* http://caffe.berkeleyvision.org/.

talk of computers that processes and subsequently learns at a much faster rate through the sum total work of the whole.[19]

Such technology is already in use in the recognition of static images. Companies like Facebook launched similar technology in 2016 that allows for automatic alt-tagging of posted images, providing a description of the image.[20] Microsoft has built in similar capabilities into its Seeing AI app, which incorporates facial recognition technology.[21] Apple also has similar technology built into its photo app and camera, allowing for an individual who is blind to know when the camera is pointed at a face, or to identify images, places, or objects in a user's photo library.[22]

While such assistive technologies are readily available, advanced scanning of multiple captured images taken from a live video feed and placing them into sequential order with more detailed description has not fully been realized. ACB has been engaged with developers across the automotive-technology industry, which is deploying similar technology in autonomous vehicle systems, wherein multiple sensors capturing surrounding environmental data have that data analyzed against similar scenario's stored in the cloud, and then send instructions to the vehicle on how to respond accordingly. This technology relies on significant amounts of data storage in the cloud, high bandwidth for fast processing, and low latency for quick response times. No such system currently exists to take live images, identify and tag, then place them into a long script of descriptive text that could then be passed through a text-to-speech engine. However, conversations with

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[19] Hof, Robert D., MIT Tech Research (July 26, 2016); available at https://www.technologyreview.com/s/513696/deep-learning/Deep Learning/.
[20] *See* https://www.wired.com/2016/04/facebook-using-ai-write-photo-captions-blind-users/.
[21] *See* https://www.microsoft.com/en-us/seeing-ai/.
[22] *See* https://www.apple.com/accessibility/iphone/vision/.

technology experts lead us to believe that a proof of concept could be drawn up to establish how such an architecture could be designed to create such an API that takes in live video and provides real-time description.

Constraints on such a system would fall upon current broadcast and cable legacy systems, which are not capable of overlaying such APIs. Additional constraints would be building up a library of pre-tagged images, and developing a system that would continue to add to such a library.

Finally, as noted in the Waiver Extension Order, the current waiver has allowed time for the matter to be considered by the DAC, which could provide consensus guidance on the capability of potential solutions to meet the needs of persons who are blind or visually impaired.[23] Petitioners have actively participated in discussions of the DAC Video Programming Working Group about this issue. We have provided speakers to educate members on various relevant issues, such as the Director of Technology and Operations for a local network affiliate station, who described the process for generating emergency crawls. We also enlisted the chief executive officer of a tech start-up that provides services to the blind through the Google Glass platform, and works on the cutting edge of artificial intelligence and accessibility. Those meetings generated useful dialog among working group members, and helped to direct Petitioners' efforts.

The DAC working group continues to discuss whether and how broadcasters may be able to aurally describe visual, non-textual emergency information in crawls on an automated basis. In addition, the working group has started to address the content of such crawls, for example, how to prioritize the information contained in a crawl to efficiently

[23] Waiver Extension Order, 31 FCC Rcd at 12543.

highlight the most important details regarding an emergency for persons who are blind or visually impaired.

III. Conclusion

Going forward, Petitioners will continue our efforts to explore software technologies that will allow broadcasters to comply with Section 79.2(b)(2)(ii) by the deadline of May 26, 2017. We respectfully request that the Commission place this status report in the record for this proceeding.

Respectfully submitted,

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